

Unit 15.5

Graphing Functions

Day 1

Graphing Polynomial Functions

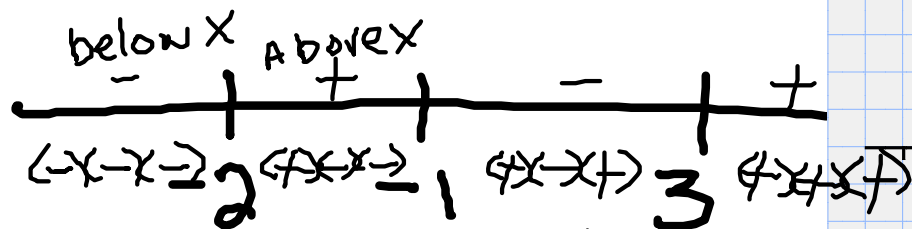
multiplicity, factor from graph, $f(0)$ is constant (x-int)

Ex1: $f(x) = x^3 - 7x - 6$

$$f(x) = (x+2)(x-3)(x+1)$$

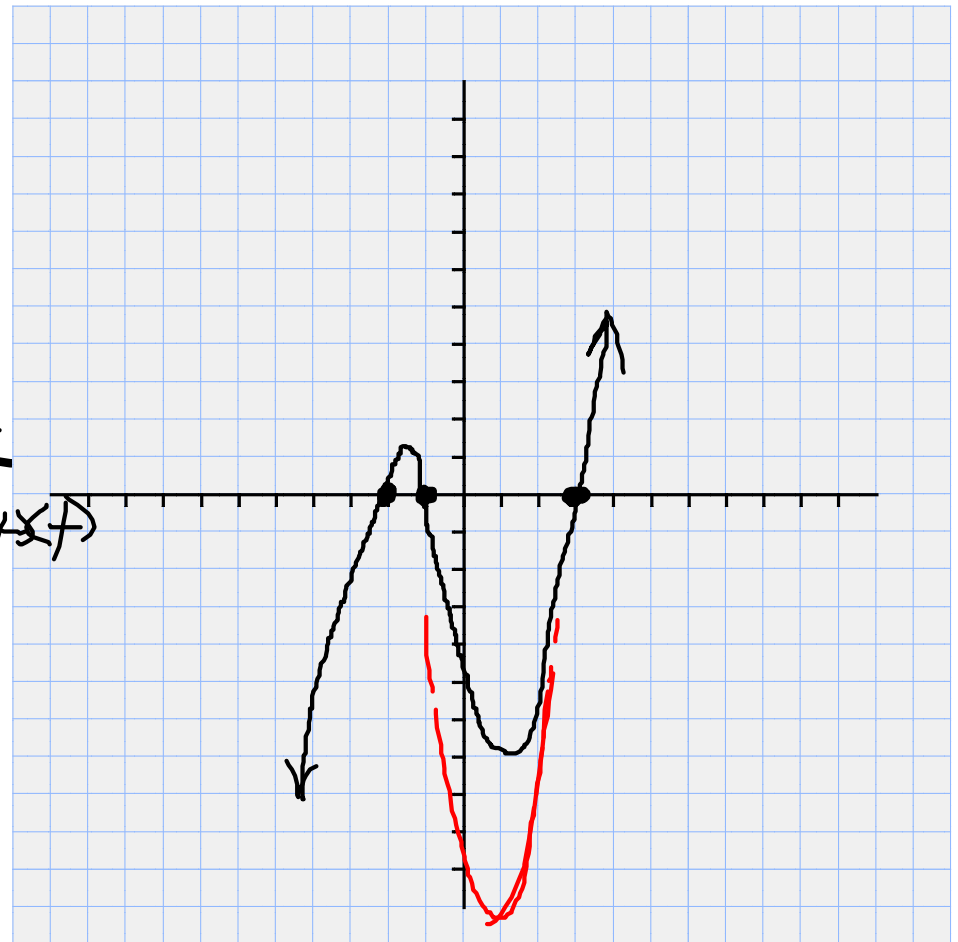
$$x = \{-2, 3, -1\}$$

\nearrow
x-int



$$f(1) = -12 \quad (1, -12)$$

$$\begin{array}{r|rrrr} 1 & 1 & 0 & -7 & -6 \\ & 1 & 1 & -6 & -12 \end{array}$$



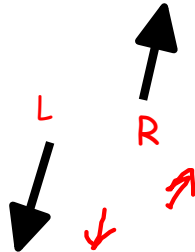
note - solution behind graph

END BEHAVIOR

ODD DEGREE

LEADING TERM POSITIVE

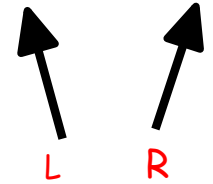
behave like $y = x^3$



EVEN DEGREE

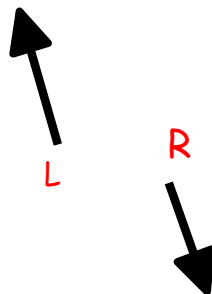
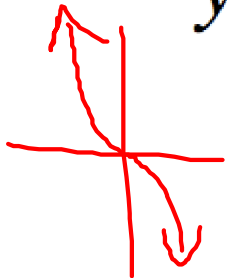
LEADING TERM POSITIVE

behave like $y = x^2$



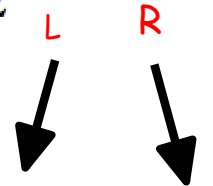
LEADING TERM NEGATIVE

behave like $y = -x^3$

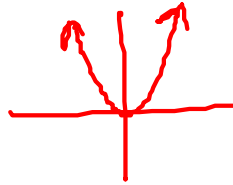


LEADING TERM NEGATIVE

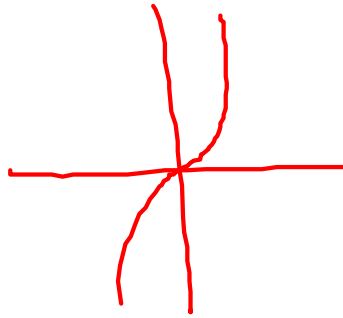
behave like $y = -x^2$



EVEN MULTIPLICITIES - touch like $y = x^2$



ODD MULTIPLICITIES - flex like $y = x^3$



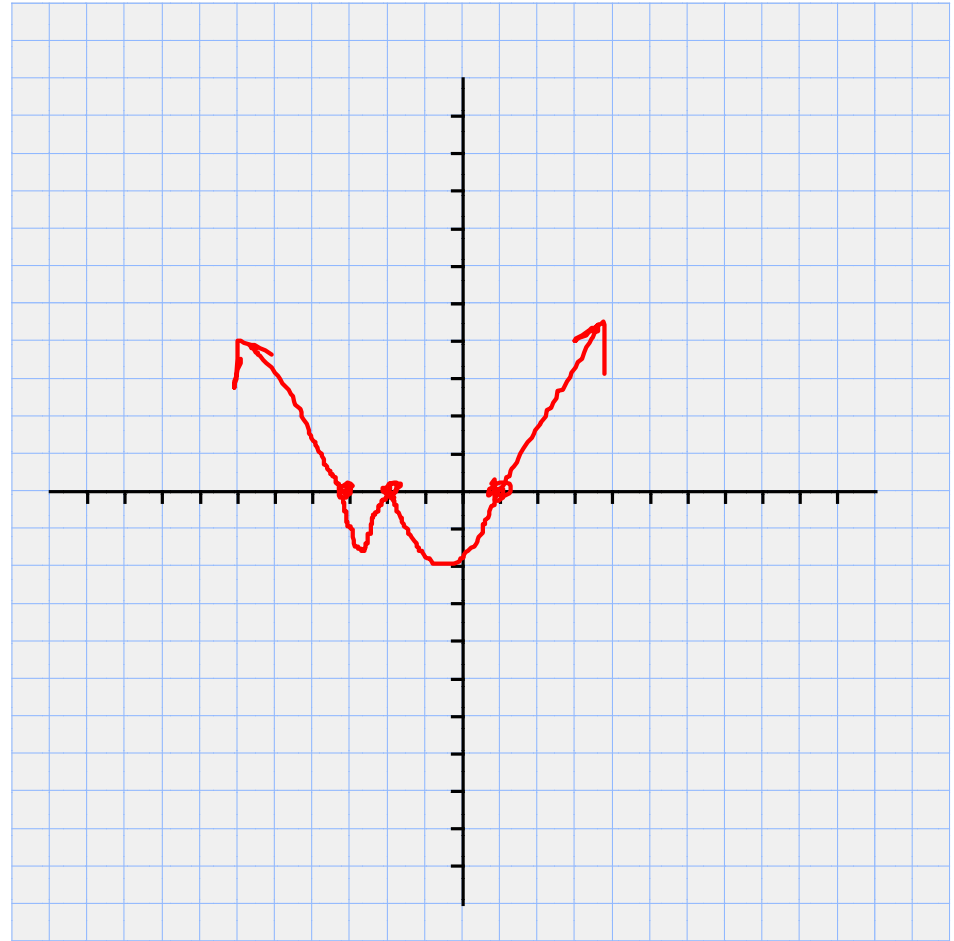
Ex2: $y = (x+2)^2(x-1)(x+3)$

$y = (x+2)^2(x-1)(x+3)$
 $x = -2 \quad x = 1 \quad x = -3$

Degree 4 \uparrow \nearrow

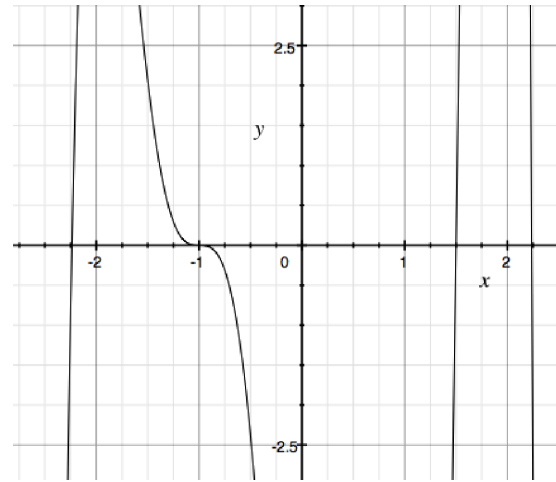
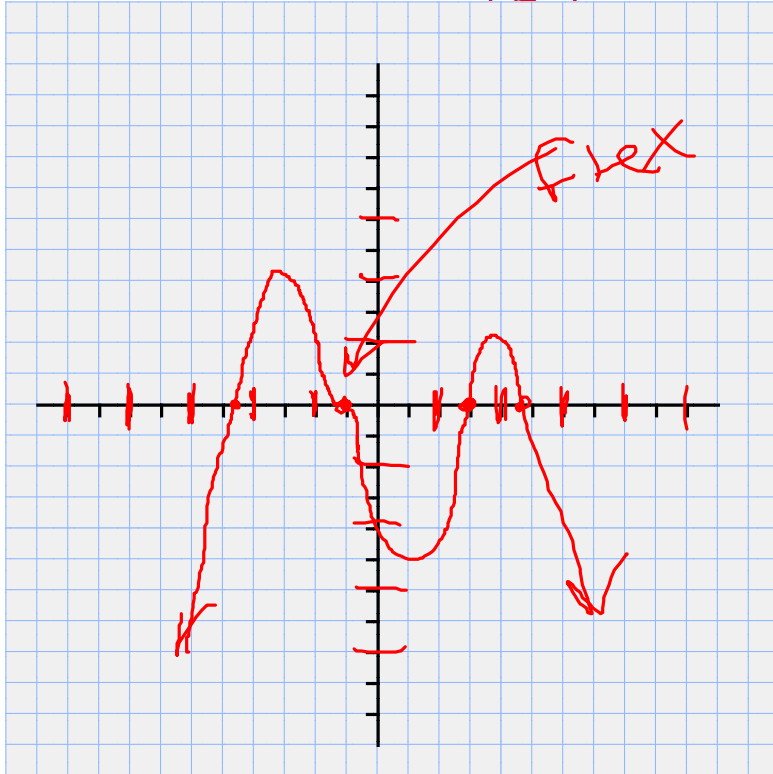
mult 2 \Rightarrow -2

odd \nearrow



Ex3: $f(x) = -(x^2 - 5)(2x - 3)(x + 1)^3$

$$x = -\sqrt{5}, \frac{3}{2}, -1$$



Homework:

Unit 15.5

Day 1

p. 311-2: 1-8 (all), 22-28 (even)